

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : ATMOSPHERIC REVIT. FMEA NO 06-1A -1402 -1 REV: 07/08/88

ASSEMBLY : EVA SUPPORT (PRE-BREATH)				CRIT. FUNC: 1R
P/N RI : V075-643300, V070-643200				CRIT. HDW: 2
P/N VENDOR:		VEHICLE	102 103 104	
QUANTITY : 2		EFFECTIVITY:	X X X	
: ONE SET PER LOOP		PHASE(S):	PL LO OO X DO LS	
: TWO SETS PER SUBSYSTEM				

PREPARED BY:		REDUNDANCY SCREEN:	A-PASS B-N/A C-PASS
DES S. CASTILLO	APPROVED BY:	DES	APPROVED BY (NASA):
REL D. RISING		REL	
QE W. SMITH		QE	

ITEM:
 LINES & FITTINGS,
 LIQUID COOLED GARMENT COOLING LOOP.

FUNCTION:
 PROVIDES THE CIRCULATION PATH BETWEEN LCG HEAT EXCHANGER AND LCG TO COOL LCG DURING THE PRE-BREATHING PORTION OF AN EVA.

FAILURE MODE:
 EXTERNAL LEAKAGE

CAUSE(S):
 MECHANICAL SHOCK, VIBRATION, CORROSION.

EFFECT(S) ON:
 (A) SUBSYSTEM (B) INTERFACES (C) MISSION (D) CREW/VEHICLE

(A) LOSS OF WATER FROM ONE LCG COOLANT LOOP.

(B) LOSS OF COOLING IN ONE LCG.

(C) LOSS OF PLANNED EVA'S.

(D) NONE.

(E) FUNCTIONAL CRITICALITY EFFECT - SECOND ASSOCIATED FAILURE (LOSS OF REDUNDANT LCG LOOP) MAY RESULT IN LOSS OF EMERGENCY EVA CAPABILITY. SCREEN 'B' IS N/A BECAUSE LOOP IS NOT PRESSURIZED UNTIL EMU COOLING PUMP IS ACTIVATED IN PREPARATION FOR AN EVA.

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DISPOSITION & RATIONALE

(A) DESIGN (B) TEST (C) INSPECTION (D) FAILURE HISTORY (E) OPERATIONAL USE

(A) DESIGN

LINEs ARE FABRICATED OF 21-6-9 STAINLESS STEEL WITH A THICKNESS OF 0.016 INCH. FITTINGS ARE DYNATUBES MADE OF 17-4 PH STAINLESS STEEL AND ARE BRAZED INTO THE SYSTEM. FITTING OR JOINT LEAKAGE IS LESS THAN 1×10^{-4} SCCS.

(B) TEST

QUALIFICATION TEST - TESTING OF 21-6-9 STAINLESS TUBING AS FOLLOWS - PRETEST PROOF (2X OPERATING PRESSURE) AND LEAK TEST (1×10^{-6} SCCS GHE MAX), BURST TEST (BURST AT GREATER THAN OR EQUAL TO 4X OPERATING PRESSURE), IMPULSE FATIGUE TEST (2×10^5 CYCLES OF IMPULSE WAVES), FLEXURE FATIGUE TEST, RANDOM VIBRATION, POST TEST LEAK TEST (1×10^{-6} SCCS HE MAX), AND DESIGN SHOCK (20 G TERMINAL SAWTOOTH PULSE OF 11 MILLISECONDS DURATION IN EACH OF THREE ORTHOGONAL AXES - 6 DIRECTIONS). DYNATUBE COUPLINGS ARE AUTHORIZED BY RI SPEC MF0004-0100 "MECHANICAL - ORBITER PROJECT PARTS LIST."

IN-VEHICLE TESTING - OVERPRESSURE AND LEAK TEST PERFORMED AFTER INSTALLATION.

OMRSD - LCG LOOP LEAK CHECKED DURING POLISHING AFTER EACH EVA FLIGHT.

(C) INSPECTION

RECEIVING INSPECTION

MATERIAL CERTIFICATIONS VERIFIED AND MAINTAINED BY INSPECTION.

CONTAMINATION CONTROL

CLEANLINESS LEVEL 25 PER MA0110-301 VERIFIED BY INSPECTION PRIOR TO AND DURING OPERATIONS.

ASSEMBLY/INSTALLATION

FABRICATION OF PARTS/COMPONENTS PER DRAWING AND SPECIFICATIONS VERIFIED BY INSPECTION. ASSEMBLY AND INSTALLATION OF SYSTEM VERIFIED BY INSPECTION. RIGID TUBING INSTALLATION PER DRAWING, INCLUDING LUBRICANTS AND TORQUES, VERIFIED BY INSPECTION.

NONDESTRUCTIVE EVALUATION

RADIOGRAPHIC INSPECTION OF INDUCTION BRAZES VERIFIED BY INSPECTION.

CRITICAL PROCESSES

BRAZING OF TUBING AND COMPONENTS VERIFIED BY INSPECTION. ELECTRICAL BONDING AND PARTS PASSIVATION VERIFIED BY INSPECTION.

TESTING

LEAK TEST VERIFIED BY INSPECTION.

HANDLING/PACKAGING

HANDLING, PACKAGING, STORAGE AND SHIPPING PROCEDURES ARE VERIFIED BY INSPECTION.

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(D) FAILURE HISTORY
NO FAILURE HISTORY.

(E) OPERATIONAL USE
EVA CREW WILL TAKE TURNS USING REDUNDANT SCU IN PREPARATION FOR
EMERGENCY EVA.